

TITLE: CLIPPING DEVICE OF AN ELECTROPLATING BASE PLATE

BACKGROUND OF THE INVENTION

(a) Technical Field of the Invention

The present invention relates to a clipping device used in clipping the
5 base plate in electroplating and in particular, a clipping device having eccentric
pressing roller to clip the base plate in the electroplating process.

(b) Description of the Prior Art

Conventional clipping device used in electroplating is an elongated plate
body having a plurality of hooks to correspond to the base plate for
10 electroplating. After that screws are used to tight and seal the inlet. The
clipping device is used to hold to be electroplated object to be placed into
acidic solution and electrolyte. The conventional clipping device required
constantly unscrewing of screws and it is thus laborious and time wasting.
Accordingly, it is an object of the present invention to provide a clipping
15 device of an electroplating base plate which mitigates the above drawback.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a clipping device of an electroplating base plate comprising a base frame connected to an electrode plate so as to link to a negative electrode; a first shaft pivotally
5 connected to the two ends of the base frame; a plurality of the pressing rollers eccentrically mounted to the first shaft so that the roller edge of the roller presses the base frame; and an operating rod including a board-pressing section having a first end pivotally mounted to the base frame which is restored constantly by a spring and a linking rod module being positioned
10 between the operating rod and the first shaft and a second end of the pressed the board-pressing section, the first shaft being rotated with an angle, i.e., the pressing roller is rotated to an angle so that there is a gap formed between the roller edge and the base frame for insertion of the base plate for electroplating, and after the releasing of the board-pressing section of the operating rod, the
15 spring causes the restoration such that the roller edge presses the electroplating base plate so as to tightly clip the electroplating base plate to proceed with electroplating operation.

Yet still another object of the present invention is to provide a clipping device of an electroplating base plate, wherein the clipping of the
20 electroplating base plate is secured by means of the eccentric pressing rollers

and the base plate will not drop even the device moves or vibrates.

Still another object of the present invention is to provide a clipping device of an electroplating base plate, wherein the operation of the clipping device is rapid and simple.

5 Yet a further object of the present invention is to provide a clipping device of an electroplating base plate, wherein the distance between the first and the second plate body is adjustable and therefore the device is applicable for different sizes base plate.

The foregoing object and summary provide only a brief introduction to
10 the present invention. To fully appreciate these and other objects of the present invention as well as the invention itself, all of which will become apparent to those skilled in the art, the following detailed description of the invention and the claims should be read in conjunction with the accompanying drawings. Throughout the specification and drawings identical reference
15 numerals refer to identical or similar parts.

Many other advantages and features of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheets of drawings in which a preferred structural embodiment incorporating the principles of the present invention is
20 shown by way of illustrative example.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the present invention.

FIG. 2 is a schematic view showing partial structure of FIG. 1 in accordance with the present invention.

5 FIG. 3 is a schematic view showing the relationship of the operating rod and the pressing roller of the present invention.

FIG. 4 is a sectional view along line 4-4 of FIG. 3 in accordance with the present invention.

10 FIG. 5 is a schematic view showing the pressing of the operating rod board-pressing section in accordance with the present invention.

FIG. 6 is a schematic view showing the clip of the electroplating baseboard of the present invention.

FIG. 7 is a partial perspective view in accordance with the present invention.

15 FIG. 8 is a schematic view of FIG. 7 of the present invention.

FIG. 9 is a schematic view showing the operating of the releasing the electrode plate of the present invention.

FIG. 10 is an enlarged view of area A of FIG. 1 in accordance with the present invention.

20 FIG. 11 is an enlarged view of area B of FIG. 1 in accordance with the

present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The following descriptions are of exemplary embodiments only, and are not intended to limit the scope, applicability or configuration of the invention in any way. Rather, the following description provides a convenient

5 illustration for implementing exemplary embodiments of the invention.

Various changes to the described embodiments may be made in the function and arrangement of the elements described without departing from the scope of the invention as set forth in the appended claims.

Referring to FIG. 1 to 11, there is shown a clipping device for an

10 electroplating base board comprising a base frame 1 connected to an electrode plate 15 so as to link to a negative electrode; a first shaft 2 pivotally connected to the two ends of the base frame 1; a plurality of the pressing rollers 3 eccentrically mounted to the first shaft 2 so that the roller edge 30 of the roller 3 presses the base frame 1; and an operating rod 4 including a board-pressing

15 section 40 having a first end 4a pivotally mounted to the base frame 1 which is restored constantly by a spring 41 and a linking rod module 42 being positioned between the operating rod 4 and the first shaft 2 and a second end 4b of the pressed the board-pressing section 40, the first shaft 2 being rotated with an angle, i.e., the pressing roller 3 is rotated to an angle so that there is a

20 gap formed between the roller edge 30 and the base frame 1 for insertion of

the base plate for electroplating, and after the releasing of the board-pressing section 40 of the operating rod 4, the spring 41 causes the restoration such that the roller edge 30 presses the electroplating base plate 5 so as to tightly clip the electroplating base plate 5 to proceed with electroplating operation.

5 As shown in FIGS. 1 to 4, the base frame 1 includes a first plate body 11 having a side wall 111 protruded at the side end, and a shaft hole 111a being formed corresponding to the side wall 111 so as to pivotally mounted the first shaft 2 therein; at least an urging plate 12 fastened to the first plate body 11 and the urging plate 12 correspondingly urges the pressing roller 3 and the
10 roller edge 30 of the pressing roller 30 approaches the urging plate 12 so as to clip an electroplating base plate 5.

As shown in FIGS. 7, 8 and 9, one side of the first plate body 11 is protruded with a protruded plate 13. The top end of the protruded plate 13 is a suspension hook 131 so as to hold onto the electroplating plate 15, and the
15 middle section of the protruded plate 13 is pivotally mounted with a cam triggering plate 14, and is mounted slidably a securing press plate 141 between the triggering plate 14 and the protruded plate 13. When the triggering plate 14 is rotated, the cam section 142 of the triggering plate 14 urges to press the securing press plate 141 at the direction of the protruded plate 13 such that the
20 securing press plate 14 tightly presses against the electrode plate 15 between

the securing press plate 141 and the protruded plate 13 so as to tightly secure the electrode plate 15. When electroplating process is completed, as shown in FIG. 9, the triggering plate 14 is turned so that the cam section 142 will not urge the securing press plate 141 such that the securing press plate 141 is
5 automatically dropped down and will not enclose the electroplating plate 15 with the protruded plate 13. At this instance, the operator can unload the entire base frame 1 from the electrode plate 15 allowing the suspension of a next base frame.

The urging plate 12 is made from metallic material covered with an
10 insulation cover 121 so as to provide stable conductivity of the electroplating plate 5. Thus, the process of electroplating is stable.

The base frame 1 is protrudingly mounted with at least a pivot seat 16 so as to pivotally connect the first end 4a of the board-pressing section 40 of the operating rod 4.

15 The base frame 1 includes at least a pressing elastic rod 17 having a first end 171 being locked to the first board body 11 and a second end 172 being constantly urged on to the urging plate 12 so as to clip the electroplating plate 5 for electroplating process.

The second end 172 of the elastic rod 17 has an inclined section or
20 circular shape so as to guide the electroplating base plate 5 to be inserted

smoothly, between the elastic rod 17 and the urging plate 12.

The operating rod 4 includes a pressing plate 40 having a first end 4a pivotally mounted to the pivotal seat 16 of the base frame 1, and between the second end 4b of the pressing plate 40 and the base frame 1, a spring 41 is
5 firmly secured for restoration of the pressing plate section of the operating rod 4.

The linking rod module 42 between the operating rod 4 and the first shaft 2 includes a securing block 421 having a first end secured to the first shaft 2; a second end being pivotally connected to the first end 4a of the pressing plate
10 section 40. When the second end 4b is pressed, the first end 4a, as shown in FIG. 5 will push the linking module 42 so that the first shaft 2 moves accordingly toward R1 direction to rotate a small angle. At the same time, the respective roller 3 eccentrically mounted to the first shaft 2 rotates a small angle and the roller edge 30 forms a gap with the urging plate 12 to allow the
15 base plate 5 for electroplating is inserted.

As shown in FIGS. 1 to 11, the clipping device includes a base frame 1 including a first plate body 11 connected to a negative electrode and the two sides of the bases frame 1 provided respectively a protruded arm 18. The end section of the protruded arm 18 is connected to a mount seat 18a (as
20 shown in FIGS. 10 and 11). The mount seat 18a includes at least an

eccentric trigger plate 182 to stably slidably connected to a sliding rod 181.

A second plate body 11' is positioned between two sliding rods 181. The base frame 1 further comprises a first shaft 2 connected to the two ends of the base frame 1; a second shaft 2' connected between two sliding rod 181; a

5 plurality of pressing rollers 3 eccentrically connected to the first and the second shaft 2, 2', and the roller edge 30 of the roller 3 is constantly pressing the base frame 1 and the second plate body 11', two operating rods 4,4' respectively includes a pressing plate section 40, 40' having one end 4a respectively pivotally mounted to the base frame 1 and a spring 41 to restore

10 to its original position. In between the pressing plate section 40, 40' of the operating rod 4,4' and the corresponding first and the second shaft 2,2' is connected to a linking module 42,42' and the second end 4b of the pressing plate section 40,40' is interlinked to the movement of the first and the second shaft 2,2' to rotate an angle. That is the pressing rollers 3 on the first and the

15 second shaft 2,2' are urged to rotate an angle so that the roller edge 30 and the first plate body 11 and the second plate body 11' to produce a gap for the insertion of a base plate for electroplating. When the pressing plate section 40,40' of the operating rod 4,4' is released, the spring 41,41' restores to its original position so that the roller edge 30 presses the base plate 5, as shown in

20 FIG. 6, to tightly clip the base plate 5 for electroplating.

The two sides of the second plate body 11' are respectively provided with a lateral wall 111' corresponding positioned with a shaft hole 111a' so as to pivotally mount the rod end of the second shaft 2'. The second plate body 11' contains at least an urging plate 12' covered with an insulation mount 121'.

5 The urging plate 12' is corresponding to a pressing roller 3 so that the roller edge 30 is constantly close or approaching the urging plate 12' to clip the plate edge of the base plate 5.

The second plate body 11' at least includes an elastic rod 17 having one end 171 locked to the second plate body 11' and the second end 172 urges the
10 urging plate 12' so as to clip tightly the base plate 5.

In between the pressing plate section 40' and the linking module 42', there is a securing block 421' having a first end connected to the second shaft 2', a linking rod 422' having one end pivotally connected to the second end of the securing block 421' and the second end pivotally connected to the first end
15 of the pressing plate section 40. When the second end 4b is pressed, the first end 4a, as shown in FIGS. 1 and 2, will push the linking rod module 42' so that the second shaft 2' rotates to a small angle, and at the same time, the plurality of pressing rollers 3 mounted at the second shaft 2' rotates a small angle such that between the roller edge 30 and the urging plate 12', a gap is
20 formed for the insertion of the plate edge of the base plates for electroplating.

As shown in FIGS. 2 and 10, the linking rod 422' includes two rods 422a, 422b, and one end of the first rod 422a is connected to a mount seat 423 pivotally mounted at least an eccentric trigger plate 423' so as to slidably connect to another rod 422b. The triggering of the plate 423' tightly
5 connects the two rods 422a, 422b so as to adjust the length of the linking rod 422' including the two rods 422a, 422b.

In accordance with the present invention, the first and the second plate body 11, 11' are in horizontal arrangement or in vertical arrangement.

The urging plates 12, 12' are covered with an insulation mount 121, 121' which is acid and alkaline resistant, in the course of electroplating, current
10 only passes to the pressing roller 3, the elastic rod 17 and the corresponding base plate 5 for electroplating, thus the electroplated layer is uniform.

It will be understood that each of the elements described above, or two or more together may also find a useful application in other types of methods
15 differing from the type described above.

While certain novel features of this invention have been shown and described and are pointed out in the annexed claim, it is not intended to be limited to the details above, since it will be understood that various omissions, modifications, substitutions and changes in the forms and details of the device
20 illustrated and in its operation can be made by those skilled in the art without

departing in any way from the spirit of the present invention.